

I claim the following:

1. A method of identifying and producing modified polypeptides comprising the steps of:

selecting diseased cells from which specific nucleotide sequences may be obtained;

determining an appropriate primer pair to encompass at least a portion of a

5 nucleotide sequence to amplify said nucleotide sequence;

screening cloned nucleotide sequences obtained from said diseased cells for modified sequences to identify sequences that encode said modified polypeptides,

expressing said modified polypeptides, and

comparing said modified polypeptides with amino acid sequences for proteins obtained from non-diseased cells to determine polypeptides having characteristics different from said non-diseased proteins.

2. The method of Claim 1 wherein said selected diseased cells are derived from hemopoietic cells.

3. The method of Claim 1 wherein said selected diseased cells are derived from leukemic leukocytes.

4. The method of Claim 1 wherein said selected diseased cells are derived from human malignancies.

5. The method of Claim 1 wherein the step of expressing said modified polypeptides is realized by expressing a DNA sequence coding for said modified polypeptide in a host cell.

6. The method of Claim 1 wherein said screening step further includes cloning said nucleotide sequence by insertion in an appropriate plasmid, said plasmid being thereafter transformed in an appropriate host.

7. A recombinantly produced polypeptide having interferon activity, being derived uniquely from diseased cells and being a modification of the natural IFN  $\alpha$  species.

8. The recombinantly produced polypeptide of Claim 7 wherein said diseased cells are derived from hemopoietic cells.

9. The recombinantly produced polypeptide of Claim 7 wherein said diseased cells are derived from leukemic leukocytes.

10. The recombinantly produced polypeptide of Claim 7 wherein said diseased cells are derived from human malignancies.

11. A recombinantly produced polypeptide having interferon activity, being derived uniquely from diseased cells and being a modification of the natural IFN  $\beta$  species.

12. The recombinantly produced polypeptide of Claim 11 wherein said diseased cells are derived from hemopoietic cells.

13. The recombinantly produced polypeptide of Claim 11 wherein said diseased cells are derived from leukemic leukocytes.

14. The recombinantly produced polypeptide of Claim 11 wherein said diseased cells are derived from human malignancies.

15. A recombinantly produced polypeptide having interferon activity, being derived uniquely from diseased cells and being a modification of the natural IFN  $\gamma$  species.

16. The recombinantly produced polypeptide of Claim 15 wherein said diseased cells are derived from leukemic leukocytes.

17. The recombinantly produced polypeptide of Claim 15 wherein said diseased cells are derived from human malignancies.

Sub A2  
18. A recombinantly produced polypeptide having interleukin-2 activity, being derived uniquely from diseased cells and being a modification of the natural interleukin-2 species.

Sub B4  
19. The recombinantly produced polypeptide of Claim 18 wherein said diseased cells are derived from leukemic leukocytes.

20. The recombinantly produced polypeptide of Claim 18 wherein said diseased cells are derived from human malignancies.

21. Human leukocyte interferon wherein the interferon has the amino acid sequence from position 1 to position 166 as depicted for Hu-IFN- $\alpha$ 001 in FIG. 1.

22. A recombinantly produced polypeptide having interferon activity and comprising the amino acid sequence of Hu-IFN- $\alpha$ 001,:

CysAspLeuProGlnThrHisSerLeuArgAsnArgArgAlaLeuIleLeuLeuAlaGln  
1 10 20  
MetGlyArgIleSerProPheSerCysLeuLysAspArgHisGluPheArgPheProGlu  
30 40  
GluGluPheAspGlyHisGlnPheGlnLysThrGlnAlaIleSerValLeuHisGluMet  
50 60  
IleGlnGlnThrPheAsnLeuPheSerThrGluAspSerSerAlaAlaTrpGluGlnSer  
70 80  
LeuLeuGluLysPheSerThrGluLeuTyrGlnGlnLeuAsnAspLeuGluAlaCysVal  
90 100  
IleGlnGluValGlyValGluGluThrProLeuMetAsnGluAspSerIleLeuAlaVal  
110 120  
ArgLysTyrPheGlnArgIleThrLeuTyrLeuThrGluLysLysTyrSerProCysAla  
130 140  
TrpGluValValArgAlaGluIleMetArgSerLeuSerPheSerThrAsnLeuGlnLys  
150 160  
ArgLeuArgArgLysAspEnd  
166

23. The polypeptide of claim 22 wherein said polypeptide is derived uniquely from diseased cells.

24. The recombinantly produced polypeptide of Claim 23 wherein said diseased cells are derived from hemopoietic cells.

25. The recombinantly produced polypeptide of Claim 23 wherein said diseased cells are derived from leukemic leukocytes.

26. The recombinantly produced polypeptide of Claim 23 wherein said diseased cells are derived from human malignancies.

27. A pharmaceutical composition for providing interferon therapy to a human comprising an effective amount of the polypeptide of claim 22 admixed with a pharmaceutically acceptable vehicle or carrier.

28. A DNA sequence comprising a sequence coding for the polypeptide comprising the amino acid sequence of human IFN- $\alpha$ 001.

29. The DNA sequence according to claim 28 operably linked with a DNA sequence capable of effecting microbial expression of said polypeptide.

30. The DNA sequence according to claim 28 operably linked with a DNA sequence capable of effecting mammalian expression of said polypeptide.

31. The DNA sequence according to claim 28 operably linked with a DNA sequence capable of effecting eucaryotic expression of said polypeptide.

32. A replicable expression vector capable of expressing a polypeptide comprising the amino acid sequence of human IFN- $\alpha$ 001 as a mature human leukocyte interferon.

33. The expression vector of claim 32 which is ~~microbial~~.

36. Plasmid pHu-IFN- $\alpha$ 001 deposited with the American Type Culture

add A27

**THE UNIVERSITY OF CHICAGO**